

ANDREI YOSEF, CEO, SORREL MEDICAL



Andrei Yosef is Chief Executive Officer of Sorrel Medical, an Eitan Group company focused on the development and manufacture of wearable drug delivery solutions for easy and efficient self-administration. He is a recognised expert in drug delivery device technology and high-end development processes, having served in several executive positions at Q Core Medical – a developer of smart infusion systems for hospital and ambulatory care settings. Dr Yosef holds a PhD in Biomedical Engineering and an MA in Mechanical Engineering, both from the Technion – Israel Institute of Technology.

In this exclusive interview with ONdrugDelivery, Dr Yosef discusses Sorrel's differentiated electro-mechanical, connected wearable injection platform, and two exciting recent milestones for the company, the opening of a state-of-the-art manufacturing facility and the signing of a significant partnership with a large pharmaceutical company.

Q The wearable injectors space is crowded. Please provide an overview of Sorrel Medical's wearable device platform. How it is differentiated from other wearable injectors, and how does it help Sorrel's partners to differentiate their therapeutic products?

A Sorrel's wearable drug delivery platform (Figure 1) is designed to provide a patient-centric and partner-focused solution for the self-administration of large-volume and high-viscosity medications. The prefilled and preloaded device configuration encourages adherence to treatment therapies and reduces the risk of medication errors. Being primary container-agnostic enables us to collaborate with multiple pharmaceutical partners to meet specific drug delivery requirements.

Sorrel devices utilise an electro-mechanical pumping mechanism for accurate and controlled drug delivery. To overcome the inherent challenge of maintaining sterility in preloaded devices, we have implemented first-of-its-kind UV LED technology for disinfection at point-of-

care, disinfecting the point of engagement between the primary container and the device's fluid path. Additionally, we have proprietary technology in place which provides a unique solution for drawing medication directly from a vial, while remaining prefilled and preloaded. This saves our partners significant time and risk, as our devices conform to the primary container of their choice.

Q Focusing in on the electrical/electronic aspects, can you describe how Sorrel came to the decision to go for an electro-mechanical device?

A With our origins in Eitan Group and the world of smart electronic infusion pumps – where we have had drug delivery devices on the market for over a decade in hospital and homecare environments – we were already familiar

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with the value of a controlled and accurate pumping mechanism, integrated with a series of sensors and completed with connectivity capabilities. We researched hundreds of target molecules to ensure that our platform could meet the requirements for a wide range of applications – whether high accuracy is needed over a long period, perhaps together with a more complex

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Figure 1: Sorrel Medical's wearable drug delivery device platform.



treatment regimen (delayed treatment, changing flow rates, patient controlled boluses/ pauses); or if only a fast bolus injection is required.

Sorrel devices incorporate multiple smart sensors, including air and occlusion detection, needle positioning, on-body attachment and more. Combined with visual, audio, and tactile indicators, this guarantees a successful self-administration experience for patients.

Our devices also include integrated connectivity, via Bluetooth and near-field communication (NFC), allowing patients to share treatment data with relevant stakeholders. Not only can the treatment data be accurately captured and easily shared between the patient, their caregiver and healthcare provider, but valuable insights can also be obtained. This can be achieved at the patient level – as a doctor learns a patient’s adherence levels and tolerability to specific medication regimens and adjusts accordingly; or collectively – looking at anonymised data from a patient population as a whole, which can produce valuable insights to pharmaceutical companies, insurers, governments and regulatory agencies.

On a project-by-project basis, we are in ongoing discussions with partners on how best and at what stage to utilise the treatment data, whether in clinical trials or a commercial product, via a smartphone app, desktop application, cloud connectivity and other channels.

Q What stage of development is the device at currently?

A Sorrel is developing a platform of wearable drug delivery devices, with different device configurations all based on the same technology. Each device is at a different level of development maturity, according to relevant collaborations in place and interest from our pharmaceutical partners.

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We have a range of offerings, from a small 1 mL device up to 30 mL capacity, utilising cartridges and vials, currently at various stages of development including verification and validation, human factors testing, animal studies and clinical trials. By the end of next year, we expect to have a number of clinical studies behind us, with different partners.

Q Congratulations on successfully partnering with a top global pharma company in July. This achievement represents a clear endorsement both of the platform and Sorrel as a company by the industry. Please could you describe Sorrel’s ongoing partnering strategy?

A We are fortunate to have received very positive feedback from the market over the past couple of years and we were very pleased to be able to announce our strategic partnership with a large pharmaceutical company earlier this summer.

Our partnering strategy is to have multiple collaborations in place in parallel, working on different device configurations and all based on the Sorrel platform technology. After introductions and engagement in an initial agreement, we generally proceed within a feasibility assessment structure. This allows our potential partners to familiarise themselves with the Sorrel technology and subsystems while testing devices in parallel. We then engage in a clinical and commercial supply agreement, customising our devices to a specific target molecule and patient population, supporting our partners in their usability studies, regulatory submissions, clinical studies and eventual commercial launch.

Q Can you outline Sorrel’s business structure? How does the group’s significant background infrastructure benefit Sorrel’s partners?

A Sorrel Medical is one of three privately held companies operating in the drug delivery space, under Eitan

Group. All three companies develop smart, electro-mechanical drug delivery devices, each focused on a slightly different market segment. After a decade of experience with infusion pumps with our sister company Q Core Medical, we were looking to expand our business into new markets. This led to the founding of Sorrel, to focus specifically on the wearable drug delivery space.

While much of our knowledge and expertise derives from experience gained from the Sapphire infusion system on the market, Sorrel has developed several innovative technological solutions to address the issues we’ve identified as critical in the wearable space.

As a group, our core strengths are: (1) R&D – technological innovations in the world of parenteral injections; (2) Quality and Regulations – a critical aspect of any medical device company; and (3) Manufacturing – an integrated part of any development project, keeping operations and high volume manufacturing in our design considerations from the get-go.

We bring these core strengths into all partnerships and collaborations, whether with the Sapphire infusion systems, the AvosetGo home infusion pumps, or the Sorrel wearable injectors. We have considerable experience in cross-functional collaborations with strategic partnerships over the years in Eitan Group, with points of input from our partners integrated throughout our development processes and procedures.

Q What’s next for Sorrel?

A Having received increasing interest from pharmaceutical and biotechnology companies over the last few years, Sorrel is moving forward with a number of development projects. In the short term, we are focusing on strengthening existing partnerships through feasibility testing and moving on to clinical trials. To facilitate this, in July 2020, we opened a new state-of-the-art manufacturing facility

which enables us to increase production capability significantly, ahead of upcoming trials and eventual commercialisation.

ABOUT THE COMPANY

Sorrel Medical is a medical device development and manufacturing company focused on prefilled wearable, on-body injectors. Its technology platform, based on a robust patent estate, is prefilled and preloaded and intended for the subcutaneous delivery of biologics, biosimilars and small molecules (doses from 1-30 mL). It is suited for multiple configurations, molecules, and indications, and is digitally integrated with Bluetooth and NFC connectivity.

Sorrel is one of three privately held companies operating under the Eitan Group, all in drug delivery devices, including Q Core Medical, Avoset Health and Sorrel Medical. Q Core Medical develops and manufactures the Sapphire infusion system, on the market in both hospital and homecare environments. Avoset Health is developing a connected homecare infusion pump, available for pharmaceutical companies in a dedicated application configuration.

The joint experience shared amongst the Eitan Group's three companies, includes development, commercialisation and manufacturing of drug delivery products across the continuum of care, multiple US FDA approvals, market presence in >20 countries, and an R&D team with

experience in parenteral drug delivery, accuracy, flow control, human factors and cybersecurity.



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Workshop Leaders: **Alex Gilbert**, Digital Medicine, **Huma**
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